

REMARKS

Claims 1-12 are pending the above-identified application. Support for the change to claim is found at page 4, lines 31-33 of the specification. Support for new claims 8-12 is found on pages 7-12 of the specification.

Issues under 35 U.S.C. § 102(b) and 103(a)

Claims 1-5 and 7 have been rejected under 35 U.S.C. 102(b) as being anticipated by Sakamoto '869 (U.S. 2002/0137869 A1).

Claim 6 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto '869 in view of Matsuda '450 (U.S.P. 6,020,450).

The above-noted rejections are traversed for the following reasons.

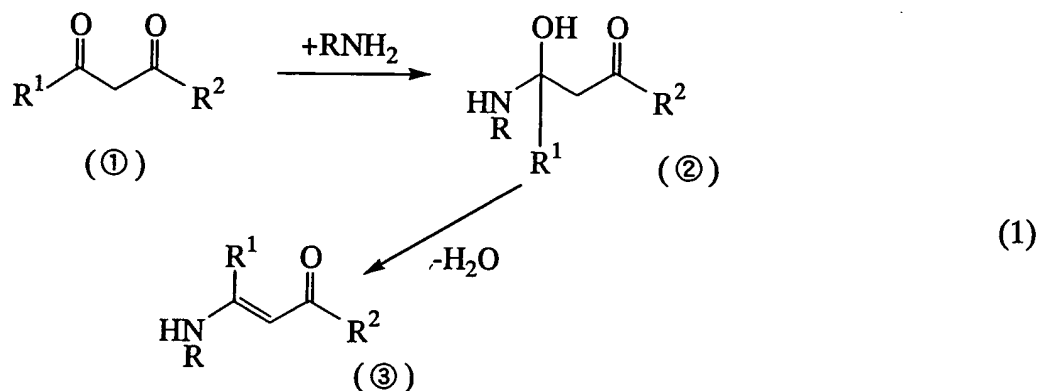
Present Invention and Its Advantages

As is disclosed in the present specification, the inventors have found that by using (A) a saturated hydrocarbon polymer having at least one hydrolyzable silyl group at an end of a backbone and/or an end of a side chain per molecule and with a number average molecular weight in the range of 500 to 50,000 as a base polymer, (B) a carbonyl compound having at least two carbonyl groups per molecule, including one carbonyl group and another carbonyl group located at the β -position relative to the one carbonyl group, and (C) an organic compound having at least one NH_2 group per molecule, and selecting components (B) and (C) such that the β -carbonyl group in component (B) is reactive with the NH_2 group in component (C) so that the dehydrating condensation reaction of the β -carbonyl group with the NH_2 group in an irreversible

reaction, a room temperature curable saturated hydrocarbon polymer composition of the condensation cure type is formulated which has improved fast-cure and deep-cure properties at room temperature and exhibits improved adhesion in the presence of water and improved electrical properties after water immersion.

More particularly, in the composition of the present invention, the β -carbonyl group in component (B) and the NH_2 group in component (C) undergo dehydrating condensation reaction, by way of which water is formed in the deep section of the composition. Consequently, the composition is dramatically improved in fast-cure and deep-cure capabilities. Not relying on the concept that water is intentionally incorporated in the composition as a deep section curing agent, the invention effectively overcomes the problems of water separation and inefficient working due to an increased thixotropy of the composition.

More importantly, the dehydrating condensation reaction of the β -carbonyl group with the NH_2 group is an irreversible reaction as shown by scheme (1). Therefore, the compound having an NH_2 group is never regenerated in the cured composition. Since the composition no longer becomes more hydrophilic than ever, water resistance and electrical properties after water immersion are dramatically improved.



In the scheme, R and R¹ each are a monovalent organic group, and R² is a monovalent organic group or alkoxy group. The organic group may contain a silicon or oxygen atom. Illustrative of R and R¹ are the same groups as will be exemplified for R³ later. Illustrative examples of R² are R³, alkoxy groups, and those groups to which R³ or silicon-containing organo groups are bonded through an oxygen atom, and preferably alkoxy groups and those groups to which R³ or silicon-containing organo groups are bonded through an oxygen atom.

Distinctions between Present Invention and Sakamoto '896

Sakamoto '869 discloses a room temperature curable composition which includes:

- (A) 100 parts by weight of a saturated hydrocarbon polymer having a number average molecular weight in the range of 500 to 50,000 and bearing at least two hydrolyzable silyl groups at an end of the backbone and/or an end of a side chain per molecule,
- (B) an organic compound having at least one C=O group in a molecule, in such an amount as to give 0.001 to 1 mol of the C=O group per 100 parts by weight of polymer (A), and
- (C) an organic compound having at least one NH₂ group in a molecule, in such an amount as to give 0.001 to 1 mol of the NH₂ group per 100 parts by weight of polymer (A), components (B) and (C) being selected such that the C=O and NH₂ groups in the respective components are reactive with each other.

Sakamoto '869 describes the following in the specification thereof:

[0024] Any desired organic compound may be used as long as it has a carbonyl (C=O) group capable of reaction as shown by scheme (I). Examples include ketones such as acetone, methyl ethyl ketone, and acetophenone, esters such as ethyl acetate, butyl acetate, methyl propionate, ethyl acrylate and butyrolactone, amides such as

dimethylformamide, diethylacetamide, and butyrolactam, carboxylic acids such as acetic acid, propionic acid, and benzoic acid, silane coupling agents having the foregoing as a functional group, and oligomers and polymers having C=O groups. Among others, ketones are especially preferred. Preferred from the standpoint of steric hindrance during reaction with component (C) is a compound in which the carbon atom at α -position relative to the carbonyl group is primary, secondary or a part of an aromatic ring. If the carbon atom at α -position is a tertiary carbon atom as usual, reactivity with an amino group may be low, with a failure to achieve the desired cure. These compounds may be used alone or in admixture of two or more.

Accordingly, Sakamoto '869 discloses embodiments corresponding to Comparative Examples 2, 3, 5, 6 and 7 of the present specification in which acetone and cyclohexane are used as component (B).

In Sakamoto '869, water is generated by the equilibration reaction between a C=O double bond-bearing organic compound and a NH₂ group-bearing organic compound. Thus a ketimine compound exists immediately after curing. Since this reaction is reversible, the ketimine compound gradually decomposes in the presence of moisture to regenerate the NH₂ group-bearing organic compound. The compound thus regenerated makes the cured composition more hydrophilic, allowing easy penetration of water into the cured composition. As a consequence, the cured composition substantially loses water resistance.

Sakamoto '869 fails to disclose or suggest the use of component (B) of the present invention, i.e., a carbonyl compound having at least two carbonyl groups per molecule, including one carbonyl group and another carbonyl group located at the β -position relative to the one carbonyl group, especially the carbonyl compounds defined in the above claim 10, particularly claim 11, whereby the β -carbonyl group is reactive with the NH₂ group so that the dehydrating condensation reaction of the β -carbonyl group with the NH₂ group is an irreversible reaction.

Consequently, sufficient patentable distinctions exist between the present invention and Sakamoto '869 such that the above-noted rejections based on Sakamoto '869 should be withdrawn.

Distinctions between Present Invention and Matsuda '450

Matsuda '450 is farther removed from the present invention and Sakamoto '869. Matsuda '450 fails to make up for the above-noted deficiencies of the disclosure of Sakamoto '869. Therefore, even the attempt to combine Matsuda '450 with Sakamoto '869 fails to provide an adequate basis for alleging *prima facie* obviousness. Consequently, the above-noted rejection based on the alleged combination of Matsuda '450 and Sakamoto '869 fails and should be withdrawn.

If any issues remain regarding the above matters, please contact Applicant's representative, Andrew D. Meikle (Reg. No. 32,868), in the Washington Metropolitan Area at the phone number listed below.

Application No. 10/820,102
Amendment dated September 13, 2005
Reply to Office Action of June 13, 2005

Docket No.: 0171-1082PUS1

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By 

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